WHAT IS CLAIMED IS:

1 \(\) A circuit arrangement for controlling audio signal transmissions for a 2 communications system that includes a microphone and a video camera, comprising:

a video processor configured and arranged to receive a video signal from the video camera, detect movement of an object in the video signal, provide a motion-

indicating signal indicating movement relative to the object; and

an audio processor coupled to the video processor and configured and arranged to modify the audio signal to be transmitted responsive to the motion-indicating signal.

- 1 2. The circuit arrangement of claim 1, wherein the object is a person.
- 1 3. The circuit arrangement of claim 1, wherein the object is a person's face.
- 1 4. The circuit arrangement of claim 1, wherein the object is a person's mouth.
- 5. The circuit arrangement of claim 1, wherein the audio processor is configured and
- 2 arranged to mule the audio signal to be transmitted responsive to the motion-indicating
- 3 signal.

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- An echo-cancellation arrangement for a video communication system that
- 2 includes a microphone, a speaker, and a video camera for use by a video conference
- 3 participant at a first location, comprising:
- a video signal processor configured and arranged to receive a video signal from
- 5 the video camera, detect mouth movement of the participant and provide a mouth-
- 6 movement signal indicative of movement of the participant's mouth;
- an echo-cancellation circuit coupled to the video signal processor and configured
- 8 and arranged to filter from an audio signal provided by the microphone sound energy
- 9 output by the speaker responsive to the mouth-movement signal.
- The arrangement of claim & wherein the video signal processor includes:

2	a background detector configured and arranged to distinguish a foreground
3	portion of an image from a background portion of the image;
4	a face detector coupled to the background detector and configured and arranged to
5	detect an image of the participant's face in the foreground portion and detect movement
6	of the participant's face; and
7	a mouth-movement detector coupled to the face detector and configured and
8	arranged to detect mouth movement in the image of the face and provide the mouth-
9	movement signal.
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1	7 % The arrangement of claim & wherein the echo-cancellation circuit includes:
2	a double-talk detector configured and arranged to detect and generate a double-
3	talk signal in response to a received audio signal and a transmit audio signal;
4	a coefficient adapter coupled to the double-talk detector and to the video signal
5	processor and configured and arranged to generate filter coefficients responsive to the
6	double-talk and mouth-movement signals; and
7	a filter coupled to the adaptive processor.
	· §
1	A video communication arrangement with video-assisted echo-cancellation, the
2	arrangement for use by a video conference participant at a first location, comprising:
3	a microphone;
4	a speaker;
5	a video camera arranged to provide a video signal;
6	a video signal processor coupled to the video camera and configured and arranged
7	to detect mouth movement of the participant in the video signal and provide a mouth-
8	movement signal indicative of the participant speaking;
9	an echo-cancellation circuit coupled to the microphone, speaker, and video signal
0	processor and configured and arranged to filter, responsive to the mouth-movement
1	signal, from an audio signal provided by the microphone sound energy output by the
2	speaker;
3	a video display device;
4	a channel interface;



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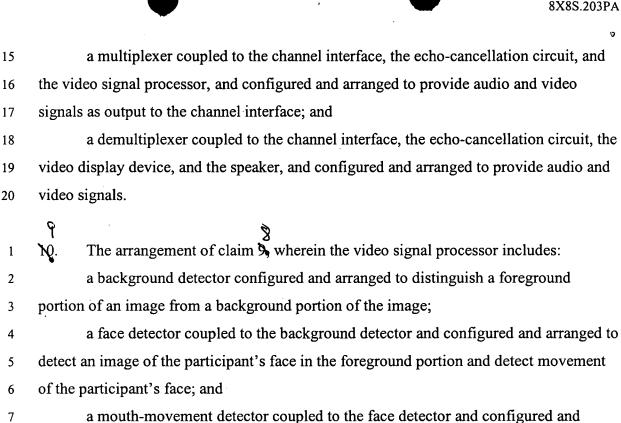
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movement signal.



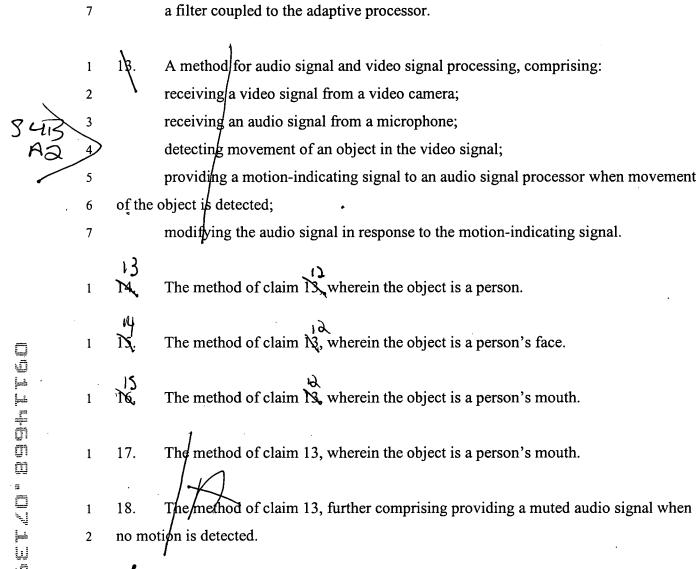
10 The arrangement of claim N, wherein the echo-cancellation circuit includes: N. 1 a double-talk detector configured and arranged to detect and generate a double-. 2 talk signal in response to a received audio signal and a transmit audio signal; 3 a coefficient adapter coupled to the double-talk detector and to the video signal 4

arranged to detect mouth movement in the image of the face and provide the mouth-

processor and configured and arranged to generate filter coefficients responsive to the double-talk and mouth-movement signals; and

a filter coupled to the adaptive processor.

11 The arrangement of claim & wherein the echo-cancellation circuit includes: ìQ. a double-talk detector configured and arranged to detect and generate a doubletalk signal in response to a received audio signal and a transmit audio signal; a coefficient adapter coupled to the double-talk detector and to the video signal processor and configured and arranged to generate filter coefficients responsive to the double-talk and mouth-movement signals; and



A method for audio signal and video signal processing, comprising: 1 receiving a video signal from a video camera; 2 receiving an audio signal from a microphone; 3 4 detecting movement of a person's mouth in the video signal; providing a motion-indicating signal to an echo-cancellation circuit when 5 6 movement is detected; and modifying filter coefficients in response to the motion-indicating signal. 7

The method of claim \(\frac{1}{2} \) further comprising: detecting a foreground portion of an image in the video signal; 2

